REMARKS

Claims 14-15, 19-20, and 23 have been canceled. Applicants cancel claim 24 and add new claims 35-37. Claims 1-13, 16-18, 21-22, and 25-37 are now pending in the application. Claims 1-12 have been withdrawn from consideration. Applicants amend claim 13, 18, 21-22, 25-26, and 31 for clarification, and add new claims 35-37 to round out the scope of the invention. Applicants refer to Figs. 1-8 and their corresponding description in the specification for exemplary embodiments of and support for the claimed invention. No new matter has been added.

The Examiner objected to claims 13, 18, 22, 25-26, and 31 for numerous informalities. Applicants amend these claims in accordance with the Examiner's suggestions, and respectfully request that the Examiner withdraw the objections.

Claim 24 was rejected under 35 U.S.C. §101 as being directed to non-statutory matter. Applicants cancel the rejected claim.

Claims 13, 16-18, 21-22, and 24-34 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Applicants' Admitted Prior Art ("AAPA") in view of U.S. Patent No. 4,756,007 to Qureshi et al. Applicants respectfully traverse the rejection.

Applicants described in AAPA an arrangement in which S/N ratio is measured by the ADSL unit AYU-R on the subscriber side to create a bit map. By reference to Fig. 37 and page 12, lines 6-12 of the specification, an internal clock 230 of the device is frequency divided to 400 Hz by a frequency divider 240 and the resulting signal is input to a phase discriminator 250. This 400-Hz signal has its phase matched beforehand to that of a 400-Hz signal (ISDN 400-Hz signal) on the office side by 400-Hz information transmitted from the office side via demodulator 210. AAPA also includes description of 400-Hz information being transmitted to the subscriber

side to create a bit map for each of NEXT interval and FEXT interval. But AAPA does not include any disclosure of the office side transmitting timing information, which specifies an interval in which effects of crosstalk from a neighboring line are received, to the subscriber side for determining transmit interval of the upstream data and receive interval of the downstream data to prevent crosstalk from the ISDN transmission line.

Qureshi et al. describe the phase between the first segment (carrier tone) and second segment (pseudo-random four-phase modulated signal) constructing a training sequence is varied by 180° in order to identify beginning of each subsequent portion of the training sequence. But Qureshi et al. do not teach that the phase is varied to transmit timing information, which specifies an interval in which effects of crosstalk from a neighboring line are received, for the data transmission/reception to the subscriber side for determining transmit interval of the upstream data and receive interval of the downstream data to prevent crosstalk from the ISDN transmission line.

Thus, neither reference discloses or suggests the claimed feature of transmitting timing information, which specifies an interval in which effects of crosstalk from a neighboring line are received, for data transmission/reception to the subscriber side for determining transmit interval of upstream data and receive interval of downstream data to prevent crosstalk from the ISDN transmission line. And even assuming, arguendo, that it would have been obvious to one skilled in the art to combine the references, the combination would, at most, have suggested a training signal for general synchronization or for determining a transmission speed of a dial-up modem. Such a combination would still have failed to disclose or suggest,

> "[a] digital subscriber line transmission method for transmitting downstream data from a device on an office side to a device on a subscriber side and upstream data from the device on

the subscriber side to the device on the office side over a single line by switching between these data transmissions in time-division fashion, dividing data of one symbol, modulating carrier waves having different frequencies by each item of divided data and frequency-multiplexing the modulated signals, and transmitting the frequency-multiplexed signals in bursts a few symbols at a time, said method comprising the steps of:

incorporating timing information, which specifies an interval in which effects of crosstalk from a neighboring line are received, in a training symbol sequence at time of training carried out prior to data communication; and

transmitting the training symbol sequence in which the timing information is incorporated from the device in the office side to the device on the subscriber side wherein the subscriber side determines a transmit interval for the upstream data and a receive interval for the downstream data based on the timing information,

wherein the timing information is incorporated in the training symbol sequence by changing the phase between adjacent training symbols by the device on the office side and a phase-change point in the training symbol sequence is detected by the device on the subscriber side and a timing which is a set time before or a set time after the phase-change detection time is adopted as the start timing of said interval," as recited in amended claim 13. (Emphasis added)

Accordingly, Applicants respectfully submit that claim 13, together with claims 16-17 dependent therefrom, is patentable over AAPA and Qureshi et al., separately and in combination, for at least the foregoing reasons. Independent claims 18, 22, 25-27, and 31 include features that correspond to those of claim 13 cited and discussed above, and are, therefore, together with claims 21, 28-30, and 32-34 dependent therefrom, respectively, patentable over the cited references for at least the same reasons.

Furthermore, Applicants described in AAPA 400-Hz information being transmitted to the subscriber side to create a bit map b-NEXT for the NEXT interval and a bit map b-FEXT for the FEXT interval in the digital subscriber line transmission based upon a Dual Bitmap scheme.

Unlike AAPA, the claimed invention is applicable to digital subscriber line transmission based upon a TDD (time division multiplex) scheme in which only one bit map is required.

Thus, AAPA only includes description of transmitting a 400-Hz signal (ISDN 400-Hz signal) on the office side to the subscriber side. And AAPA does not include any disclosure on how to transmit the 400-Hz signal (ISDN 400-Hz signal) on the office side to the subscriber side at all. Contrary to AAPA, the claimed invention provides for notifying the subscriber of the timing information by varying the phase of adjacent symbols constructing a training symbol sequence by 90° or 180° during a FEXT interval, which is a transmit interval of the ISDN ping-pong transmission.

Additionally, the claimed invention provides for notifying the subscriber of the timing information by quadrature modulating a carrier wave of a predetermined frequency and varying the phase of adjacent symbols constructing a training symbol sequence by 90° and 180° during a FEXT interval.

The techniques described in Qureshi et al. do not relate to TDD-digital subscriber line transmissions. And Qureshi et al. do not disclose a carrier wave of a predetermined frequency is quadrature-modulated and the phase of adjacent symbols constructing a training symbol sequence is varied by 90° or 180° during a FEXT interval.

For the foregoing reasons, Applicants respectfully submit that claims 35-37 are patentable over the cited references.

In view of the remarks set forth above, this application is in condition for allowance which action is respectfully requested. However, if for any reason the Examiner should consider this application not to be in condition for allowance, the Examiner is respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action.

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Respectfully submitted,

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